ORIGINAL ARTICLE

Psychological Distress and Its Association with Functional Disability Index Among Acne Patients Attending Dermatology Clinics in the Kuantan Tertiary Hospitals

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ABSTRACT

Introduction: Acne is the most common skin disease among adolescents and has significant psychological distress. Our objective is to assess acne severity, functional disability, and its psychological distress among acne patients. **Methods:** A cross-sectional study was conducted from November 2021 to May 2022 among 163 acne patients attending Dermatology Clinics in the district of Kuantan, Pahang. The severity of acne was graded using the Comprehensive Acne Severity Scale (CASS). The functional disability index was measured using a Cardiff Acne Disability Index (CADI), while Depression, Anxiety and Stress Scale (DASS-21) questionnaires were used as a screening tool to detect the psychological distress of acne. Data were analysed using a Chi-square test, Fisher's exact test and multiple logistic regression. **Results:** The mean age was 23 years, 60.1% were female, 94.5% were Malay, and 68.1% were unemployed. The severity of acne was more prominent in the mild (30.7%) and moderate (28.2%) categories. A total of 20.2%, 11.7%, and 4.9% of the respondents had anxiety, depression, and stress symptoms, respectively. Regarding the respondents' functional disability, 40.5% had mild impairment, 38.0% had moderate impairment, and 13.5% had severe impairment. Acne severity was found to be significantly associated with the functional disability index ($P<0.05$). The functional disability index was also found to be significantly associated with depression ($p=0.019$) and anxiety symptoms ($p=0.042$). **Conclusion:** Clinical management of acne patients should include not only pharmacological treatment but also consideration of the disease's functional disability status and psychological distress.
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Keywords: Acne; CADI; Functional disability index; Psychological Distress, DASS-21

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INTRODUCTION

Acne vulgaris is characterised by comedones, papules, pustules, nodules, and scars. It is a multifactorial disease affecting the pilosebaceous follicle. It is commonly known to occur in adolescent age. The prevalence of acne varies in the adolescent population, estimated to be between 53.5% to 85.9% (1,2). Epidemiological studies on acne mainly focus on adolescents, as the disease occurs in a psychologically labile period. Acne can cause a change in appearance and negatively impact psychosocial and quality of life (3). Multiple factors are thought to be related to the development of acne, and these include positive family history, hormonal, body mass index, environmental, immunological, and genetic factors (4).

There are many common misconceptions about acne vulgaris, and one of the misconceptions is that acne is a minor condition that does not entail medical attention. The poor perception of acne condition occurred due to insufficient knowledge about the disease (5). As a result, it is not surprising that a susceptible individual with acne has delayed treatment or taken inappropriate measures.

A strong predictor of patients seeking dermatological consultation, independent of disease severity, is health-related quality of life, which can be assessed using an acne-specific Cardiff acne disability index (CADI). CADI is a simplified questionnaire which can be administered to patients while attending their dermatology clinic consultation (6).

Acne also has significant psychological distress and is not only a cosmetic problem. It is not only causing physical scarring but potentially leads to psychological and emotional distress (7). Compared to individuals without acne, individuals with acne have to deal with more emotional challenges. This includes feeling stressed, anxious and less attractive, especially among female adolescents. Even though acne's effect may not cause severe morbidity or physical disability, there is still a risk of suicidal ideation found around 6-7% in acne patients (5). The impact of acne can also potentially worsen and cause psychiatric diseases such as depression and suicide (8). Therefore, acne should be regarded as a psychologically disabling disease that necessitates optimal management and resource allocation. Given this, the present study was conducted to determine the severity of acne and its association with psychological distress and the functional disability index among acne patients attending dermatology clinics in tertiary hospitals.

MATERIALS AND METHODS

A cross-sectional study was carried out among acne patients attending the Dermatology clinic in Hospital Tengku Ampuan Afzan, HTAA, and Sultan Ahmad Shah Medical Centre@IIUM, SASMEC, Kuantan, Pahang. The study was conducted from November 2021 to May 2022, involving 163 respondents who were recruited via universal sampling. The respondents were recruited among acne patients aged 13 and above attending dermatology outpatient clinics in two hospitals in Kuantan, Pahang. Patients with other forms of dermatological diseases and with underlying psychological disorders were excluded from the study.

The validated English and Malay questionnaires were used as the research tools in this study. The questionnaires consist of three sections: socio-demographic profiles, Cardiff Acne Disability Index (CADI), and Depression Anxiety Stress Scales (DASS-21).

The Comprehensive Acne Severity Scale is a tool for determining the severity of facial acne (CASS). It is a less complicated method that can be used in clinical practice. It has a strong correlation with Leed's technique for assessing facial and truncal acne (9). The evaluation was performed 2.5 meters away from acne on the face, chest, and back. The severity of each region was a scale from 0 to 5, with a Scale of 0 clear, 1 almost clear, 2 mild, 3 moderate, 4 severe, and 5 very severe.

Cardiff Acne Disability Index (CADI) (9) is a 5-item validated questionnaire based on the longer Acne Disability Index (10). The five questions address feelings of aggression, frustration, interference with social life, avoidance of public changing facilities, and the appearance of the skin over the previous month as well as an indication of how bad the acne is now. The CADI score is calculated by adding the scores from each question yielding a maximum of 15 and a minimum of 0. Grade scores for CADI were defined as not impaired (score of 0), mildly impaired (score -5), moderately impaired (score 6-10) and severely impaired (score 11 – 15). The lower the cumulative CADI score, the lower the level of disability experienced by the patients, while a higher score indicated a higher level of disability. Permission to use CADI has been obtained from Professor Andrew Finlay (License ID CUQoL3209).

Depression Anxiety Stress Scale (DASS) is a screening tool to assess depression, anxiety, and stress symptoms. DASS is available in two versions: the full 42-item version and the shorter 21-item version. Because the 21-item version of DASS (DASS-21) is easier to use in a clinical setting, it was chosen for this study. Both validated English and Malay versions were used (11). DASS-21 is a self-report scale that assesses three negative emotional states: depression, anxiety, and stress. It has seven self-reported items in each of the three subscales: The depression sub-scale assesses hopelessness, low left esteem, and low positive affect. The anxiety sub-scale evaluates autonomic arousal, musculoskeletal symptoms, situational anxiety, and subjective experience of anxious arousal. The stress sub-scale will assess tension, agitation, and negative affect.

IBM SPSS version 28 was used to analyse the data. To determine the relationship between categorical variables, the Pearson Chi-square test was used (socio-demographic, CASS, CADI, and DASS-21). Furthermore, when an assumption was violated, such as an expected cell count of less than five, Fisher's exact test was used instead of the Pearson Chi-square test. Multiple logistic analysis was used to control for the confounders in the final analysis. All p-values less than 0.05 were considered significant. This study received ethical approval from the Medical Research and Ethics Committee of the Ministry of Health Malaysia (NMRR- 21-1462-60239) on 5 November 2021.

RESULTS

Table I shows the socio-demographic profiles of acne patients involved in the study. The majority of the participants were women (60.1%), Malays (94.5%), and unemployed (68.1%). The mean age of all respondents was 22.6±4 years old. Most of the respondents were in the no-income category of the total household income group (70.6%) and had a tertiary education level (76.7%).

Using the Comprehensive Acne Severity Scale (CASS), out of 163 respondents, 1.2% and 19.6% were in the very severe and severe categories of acne, while 28.2% and 30.7% were in the moderate and mild categories, respectively. In contrast, 17.8% were found to have almost clear acne severity.

Table I Socio-demographic, CASS, CADI, and DASS of the acne patients (N=163)

Variables	Frequency, n (%)
Age	*22.58 ± 4.45
13-23 years old	112 (68.7)
24-33 years old	47 (28.8)
34-43 years old	4 (2.5)
Gender	
Male	65 (39.9)
Female	98 (60.1)
Ethnic	
Malay	154 (94.5)
Non-Malay	9 (5.5)
Educational Level	
No Formal Education	3 (1.8)
Primary	3 (1.8)
Secondary	32 (19.6)
Tertiary	125 (76.7)
Employment Status	
Employed	52 (31.9)
Unemployed	111 (68.1)
Income per month	
No income	115 (70.6)
<RM3000	31 (19.0)
>RM3000	17 (10.4)
CASS	
Very severe	2 (1.2)
Severe	32 (19.6)
Moderate	46 (28.2)
Mild	50 (30.7)
Almost clear	29 (17.8)
Clear	4 (2.5)
CADI score	
Not impaired	13 (8.0)
Mildly impaired	66 (40.5)
Moderate impaired	62 (38.0)
Severely impaired	22 (13.5)
Depression	
Yes	19 (11.7)
Mild	10 (6.2)
Moderate	8 (4.9)
Severe	0 (0.0)
Extremely severe	1 (0.6)
No	144 (88.3)
Anxiety	
Yes	33 (20.2)
Mild	14 (8.6)
Moderate	14 (8.6)
Severe	4 (2.5)
Extremely severe	1 (0.6)
No	130 (79.8)
Stress	
Yes	8(4.9)
Mild	4 (2.4)
Moderate	3 (1.8)
Severe	0 (0.0)
Extremely severe	1 (0.6)
No	155 (95.1)

*Mean± SD

Regarding the respondents' functional disability, 40.5% had mild impairment, 38.0% had moderate impairment, and 13.5% had severe impairment.

DASS-21 scores indicated that 20.2%, 11.7%, and 4.9% of the respondents had anxiety, depression, and stress symptoms, respectively. Of respondents with depression, 6.2% had mild depression, 4.9% had moderate depression and 0.6% had extremely severe depression. While respondents with anxiety, 8.6% had mild anxiety, 8.6% had moderate anxiety, 2.5% had severe anxiety, and 0.6% had extremely severe anxiety. Stress severity in respondents was very low, with mild at 2.4%, moderate at 1.8%, and extremely severe at 0.6%, respectively.

Table II shows the relationship between socio-demographic factors and acne severity (CASS) among acne patients. In this study, most patients having mild to severe acne were among patients aged 13-23years old (81.2%), female (80.6%), Malay (79.2%), had tertiary education level (76.8%), unemployed (82.9%) and having no income (81.7%). While patients with clear to almost clear acne were also among the same categories as mild to severe acne. The results indicate that socio-demographic factors were not significantly associated with the severity of acne ($p>0.05$).

The relationship between acne severity (CASS) and functional disability (CADI) is shown in Table III. Among those with mild to severe acne, 37.7%, 45.4%, and 14.6% of them had mildly impaired, moderately

Table II: Relationship between Socio-demographic factors and acne severity (CASS) among acne patients (N=163)

Sociodemographic	CASS		Chi-square χ^2	P-value
	Mild/ moderate/ Severe n (%)	Clear/ almost clear n (%)		
Age			28.774	0.183
13-23 years old	91 (81.2)	21 (18.8)		
24-33 years old	37 (78.7)	10 (21.3)		
34-43 years old	2 (50.0)	2 (50.0)		
Gender			0.112	0.843
Male	51 (78.5)	14 (21.5)		
Female	79 (80.6)	19 (19.4)		
Ethnic			0.492	0.688
Malay	122 (79.2)	32 (20.8)		
Non-Malay	8 (88.9)	1 (11.1)		
Educational Level			5.194	0.158
Primary & No Formal Education	4 (67.7)	2 (33.3)		
Secondary	30 (93.7)	2 (6.3)		
Tertiary	96 (76.8)	29 (23.2)		
Employment Status			2.109	0.209
Employed	38 (73.1)	14 (26.9)		
Unemployed	92 (82.9)	19 (17.1)		
Income (month)			7.278	0.364
No income	94 (81.7)	21 (18.3)		
<RM3000	25 (80.6)	6 (19.4)		
>RM3000	11 (64.7)	6 (35.3)		

Table III: Relationship between CASS and CADI (N=163)

CASS	CADI = n (%)				Chi square χ^2	P-value
	Not impaired	Mildly impaired	Moderately impaired	Severely impaired		
Mild/moderate/severe	3 (2.3)	49 (37.7)	59 (45.4)	19 (14.6)	36.815	< 0.001
Clear/almost clear	10 (30.3)	17 (51.5)	3 (9.1)	3 (9.1)		

impaired, and severely impaired functional disabilities, respectively. Most patients with clear and almost clear acne severity had mildly impaired (51.1%), and not impaired (30.3%) functional disabilities. Overall, acne severity was found to be significantly associated with functional disability (p<0.001).

Table IV shows the relationship between CASS and DASS. The study has shown that mild to severe acne severity patients had 10.8%, 20.8%, and 5.4% of depression, anxiety, and stress symptoms, respectively. While respondents with clear and almost clear acne severity had only lower percentages of anxiety and stress at 18.2% and 3%, respectively. The depression symptoms indicated 15.2%, higher than the mild to severe acne severity due to the small number of the dominator. Overall, the acne severity from the CASS results was not significantly associated with depression, anxiety, and stress symptoms (p>0.05).

Table V shows the relationship between CADI and DASS, where the acne disability index severity was significantly associated with depression (p=0.009), anxiety (p<0.001). For respondents with a mildly impaired acne disability index, the study showed that 4.5% and 7.6% of them had depression and anxiety symptoms, respectively. In comparison, respondents with moderate impairment of acne disability index had a higher percentage of 12.9% and 22.6% for depression and anxiety symptoms, respectively. Acne patients who were found to have severely impaired CADI scored a much higher percentage of depression (31.8%) and anxiety (54.5%), respectively.

The interaction between CASS and CADI with DASS was tested to identify if there was an interaction between these variables (Table VI). The acne severity was significantly associated with functional disability (p<0.001), and functional disability was associated with depression and anxiety (p<0.05). However, it was found that the interaction between acne severity and acne disability was not associated with depression (p=0.629) and anxiety (p=0.826).

In this study, participants who had impairment in the functional disability index were significantly associated with depression and anxiety symptoms (Table VII). Those severely impaired in the disability index were 27 times and 10 times more likely to develop depression (p=0.019) and anxiety symptoms (p=0.042), respectively,

Table IV: Relationship between CASS and DASS (N=163)

CASS	DASS											
	Depression n(%)		χ^2	P-value	Anxiety n(%)		χ^2	P-value	Stress n(%)		χ^2	P-value
	Yes	No			Yes	No			Yes	No		
Mild/moderate/severe	14 (10.8)	116 (89.2)	0.491	0.544	27 (20.8)	103 (79.2)	0.109	0.814	7 (5.4)	123 (94.6)	0.313	0.697
Clear/almost clear	5 (15.2)	28 (84.8)			6 (18.2)	27 (81.8)			1 (3.0)	32 (97.0)		

Table V: The relationship between CADI and DASS (N=163)

CADI	Depression n(%)		P-value *	Anxiety n(%)		P-value *	Stress n(%)		P-value *
	Yes	No		Yes	No		Yes	No	
Not impaired	1 (7.7)	12 (92.3)	0.009	2 (15.4)	11 (84.6)	<0.001	0 (0.0)	13 (100.0)	0.062
Mildly impaired	3 (4.5)	63 (95.5)		5 (7.6)	61 (92.4)		2 (3.0)	64 (97.0)	
Moderately impaired	8 (12.9)	54 (87.1)		14 (22.6)	48 (77.4)		2 (3.2)	60 (96.8)	
Severely impaired	7 (31.8)	15 (68.2)		12 (54.5)	10 (45.5)		4 (18.2)	18 (81.8)	

* Fisher's exact test

Table VI: The interaction between CASS and CADI with DASS (N=163)

CADI*CASS	Depression	P-value	Anxiety	P-value
	95% CI		95% CI	
CADI*CASS		0.629		0.826
CADI(1)*CASS(1)	0.813(0.096,6.844)	0.849	0.897(0.180,4.455)	0.894
CADI(2)*CASS(1)	0.457(0.057,3.683)	0.462	0.478(0.103,2.212)	0.345
CADI(3)*CASS(1)	3.656(0.313,42.652)	0.301	-	0.999

Table VII: Association of Socio-demographic, CASS, and CADI with Depression and Anxiety among Acne Patients (N=163)

Variables	Adjusted OR for Depression (95% CI)	P-value	Adjusted OR for Anxiety (95% CI)	P-value
Age		0.866		0.080
13-23 years old	Ref.		Ref.	
24-33 years old	0.685 (0.171,2.736)	0.592	0.251 (0.075,0.837)	0.025
34-43 years old	-	0.999	-	0.999
Gender				
Male	Ref.		Ref.	
Female	2.339 (0.590, 9.276)	0.227	2.185 (0.786,6.077)	0.134
Ethnic				
Malay	Ref.		Ref.	
Non-Malay	0.954 (0.058,15.598)	0.974	1.891 (0.252,14.176)	0.535
Educational Level		0.988		0.762
Primary & No Formal Education	Ref.		Ref.	
Secondary	1.222 (0.076,19.553)	0.888	0.491 (0.056,4.267)	0.519
Tertiary	1.203 (0.106,13.608)	0.881	0.728 (0.106,4.983)	0.747
Employment Status				
Employed	Ref.		Ref.	
Unemployed	0.395 (0.097,1.601)	0.193	1.131 (0.360,3.559)	0.833
Income per month				0.292
No income	Ref.		Ref.	
<RM3000	0.153 (0.020,1.153)	0.069	2.223 (0.593,8.330)	0.236
>RM3000	0.229 (0.018, 2.888)	0.255	0.403 (0.036,4.509)	0.461
CASS				
Mild/Moderate/ Severe	Ref.		Ref.	
Clear/almost clear	0.178 (0.030,1.067)	0.059	0.492 (0.116,2.088)	0.337
CADI score		0.013		0.002
Not impaired	Ref.		Ref.	
Mildly impaired	1.428 (0.114,17.857)	0.782	0.682 (0.093,5.011)	0.707
Moderate impaired	10.211 (0.629,165.707)	0.102	3.351 (0.400,28.081)	0.265
Severely impaired	27.219 (1.717,431.584)	0.019	9.639 (1.090,85.231)	0.042

than those who were not impaired. However, there was no significant association between other factors, such as acne severity and the socio-demographic profiles of the respondents, including age, gender, ethnicity, educational level, employment status, and total household income, with depression and anxiety symptoms.

DISCUSSION

Acne vulgaris is one of the most common dermatological conditions, with an increasing prevalence with time among adolescents (2). In recent years, there has been a lack of local studies regarding the functional disability and psychological distress of acne in Malaysia, especially in the East Coast of Malaysia. Furthermore, the implication of functional disability and psychological distress among risk groups, adolescents, and young adults in our society could be profound unless early screening measures are applied. As acne has a wide range of potential harm and associated cost, it is critical to identify early patients at risk of functional disability or psychological symptoms for early intervention. Additionally, severe acne conditions can negatively affect jobs, careers and self-confidence due to its consequences, such as scarring and hyperpigmentation (12).

Our study showed that most participants were Malays (94.5%). Malays were the majority ethnic group in Kuantan (76.3%) based on the data population by the Department of Statistics Malaysia (13). However, our results showed an over-representative of Malay ethnicity compared to the data population in Kuantan due to the universal sampling method used in this study, which led to sampling bias. Additionally, the preference of Malays ethnicity for attending the dermatological clinic at government hospitals compared to other ethnic groups may have contributed to a higher Malay response rate in the study. A similar pattern was observed in a study done in Muar, Johor, where the majority of dermatological patients were Malays, followed by Chinese and Indians (14).

In our study, most respondents were women (60.1%). Among them, 80.6% had mild to severe acne. A similar finding was also shown in a previous study which reported that the prevalence of acne is higher in females than in males (14). Our findings were also supported by other studies conducted in Nottingham, Lithuania, and Serdang, where most respondents were female (15-17). A possible explanation could be that acne causes more embarrassment in females as females are more concerned about their appearance. Due to this reason, they seek early dermatology consultation (18).

Because the majority of the respondents in our study were university students, they are still studying, and this explains why most of our respondents have no income and are within the unemployed categories. However, a previous study in Malaysia had shown that lower socioeconomic status significantly affects the quality of life in acne patients. It was also found that those with a higher income and education level were more aware of acne and sought medical attention (19).

The majority of respondents were from age between 13 to 23 years old. A possible explanation could be that acne disease was prevalent among this young age group. This could be due to the hormonal surge that causes increased sebum excretion before and during puberty. A similar pattern has been observed from previous research conducted in Hospital Serdang, Malaysia and

Singapore Chinese population (15-16).

Assessment of acne severity was done using the CASS scoring scale. A local study conducted at Universiti Kebangsaan Malaysia (UKM) among medical students found that only 44.3% of participants had acne within mild and moderate severity using CASS measurement (20). In another study done in Hospital Serdang, most patients had mild and moderate acne severity at 36.4% and 43.6%, respectively, compared with almost clear, severe, and very severe (15). Our finding supports these previous studies with a similar finding of mild and moderate severity of acne was 58.9%. This may be due to all the studies using a similar acne severity scale, CASS.

In another study done among Egyptian adolescents using the global acne grading system (GAGS) majority of students had mild acne (75.5%) with a prevalence acne of 24.4%, higher among females (28.6%) than males (20.2%) (21). Similar findings were also observed in Iran using the GAGS scale (22). Despite several acne grading severity scoring that has been used, there is no internationally agreed-upon which grading scoring is the most useful to determine acne severity. Nonetheless, because it was performed by training personnel, CASS was found to be accurate and to have minimal inter and intra-grader variability in this study (9).

Our study also explored the relationship between acne severity and functional disability by using the Cardiff Acne Disability Index (CADI). CADI helps in identifying an area of concern in patients with acne. CADI subscale analysis includes emotional difficulties (felt aggressive, frustrated), social interference/difficulties, and psychological state. Our findings showed there is a significant correlation between acne severity and CADI, as most respondents had mildly and moderately impaired functional disabilities, 40.5% and 38.0%, respectively. A study in Malaysia also indicated similar impairment, where 59.5% had mild impairment, 28.5% had moderate impairment, and 12% had severe impairment (23). An almost similar pattern of functional disability index impairment was shown by a study conducted in Egypt which showed 11.4% of students had severe disability impairment, while 49% of students had mild impairment (21). This concludes that using the CADI instrument helped patients to express their quality of life due to acne. Another study conducted, comparing participants in two cohorts between community and hospital-based, also showed that both settings had a significant relationship between acne severity and CADI. The study also highlights that most participants do not seek medical attention due to embarrassment and feeling that acne disease does not require treatment, as well as a lack of open discussion between patient and doctor during the clinical consultation (24). Our findings are consistent with previous studies demonstrating that the CADI was simple to use and clinically significant in the patient management of acne. (13-14,21,23-24).

As mentioned in the previous literature (3,6), acne has psychological implications, especially for those in the severe category of acne. Therefore, it is important to screen acne patients for psychological distress, such as depression, anxiety, and stress symptoms. DASS-21 is widely used as a screening tool to assess these symptoms before proper psychiatric evaluation is done to confirm the diagnosis. According to the Diagnostic and Statistical Manual of Mental Disorders, major depressive disorder is defined as having a severely depressed mood that lasts at least two weeks, whereas generalised anxiety disorder is defined as worrying on most days for at least six months (25). Our study shows that 11.7% of respondents experienced depressive symptoms, 20.2% experienced anxiety symptoms, and 4.9% experienced stress symptoms. A much higher percentage of psychological distress was also observed in one of the local studies conducted among 55 acne patients in the dermatology clinic, where 70% of patients reported having anxiety, while less than 50% were found to experience depression and stress (15). A study from the region of Gujarat in the west coast of India also reported higher stress symptoms at approximately 70%, followed by anxiety symptoms at 47.8% and fewer symptoms of depression at around 19.6%, by using a similar questionnaire DASS-21 in Hindi translation (26).

In different methods, a case-control study done in Iran showed a significant difference in psychological effects between the two groups of patients and the control group (27). The study showed a higher prevalence of anxiety among acne patients (68.3%) compared to the control group without acne (25.6%). One of the reasons could be due to the self-body image. Face plays an important role in that even a minor lesion may be uncomfortable and can cause psychological problems such as low self-esteem, anxiety, and depression. According to the results of a study conducted in Lithuania using the Hospital Anxiety and Depression Scale (HADS), suicidal ideation evaluation, and Dermatology Life Quality Index (DLQI), 38.4% of participants had anxiety, 23.1% had depression, and 12.9% had suicidal ideation due to acne (17). Although different screening tool was used to assess the psychological distress among acne patients, the potential of developing mental health illness due to acne was clearly established.

Our study did not find any significant association between socio-demographic factors and acne severity ($p > 0.05$). However, we found that the prevalence of acne severity was higher among the adolescent age group between 13 to 23 years old. A study conducted in Muar, Johor, demonstrated that acne severity increases as age increases within the adolescent age group (14). Similarly, our data also demonstrated a significant relationship between CADI and acne severity ($p<0.05$). The possible explanation could be due to more patients

having mild to moderate acne severity, as demonstrated in this study. This indicates that the impact of acne on quality of life in managing acne is essential. However, another hospital-based study demonstrated that the relationship between acne severity and CADI was insignificant (15). This could be due to the different population characteristics and study design.

The DASS screening tool was previously reported to be useful and had a relatively satisfactory psychometric property for clinical subjects in Malaysia for screening of anxiety and depression compared with Hospital Anxiety and Depressive Scale (HADS) (11). However, our study demonstrated that there was no significant relationship between acne severity and psychological impact which was also demonstrated in another study (15). In contrast to our study, a study conducted in India showed there was a significant association between acne severity with psychological impact, where the prevalence of depression was 19.5%, and anxiety was 47.8%. This could be due to the longer duration of acne among their respondents in relation to anxiety and depression (26). Another study in Jeddah also shows a significant correlation between acne severity and stress. This is due to multiple mechanisms that can trigger or worsens acne (28).

Depression is a major cause of morbidity and disability, with a high disease burden in many countries. Depression is the fourth most common disorder in the world, and it is expected to be the most common disorder in high-income countries by 2030 (29). We found that those with severely impaired in the disability index were 27 times more likely to develop depression than those who were not impaired (p=0.019), with a prevalence of 11% from all respondents. Our findings were consistent with a study done in Hospital Serdang, as CADI was found to be significantly related to depression (p=0.012), anxiety (p=0.015), and stress (p=0.001) (15). This result was expected as psychological symptoms are associated with functional disability (30). Therefore, it is paramount for all treating doctors to be made aware of this possibility when treating acne patients, particularly those with severe results of functional disability index.

Our study also found that the prevalence of anxiety was 20.2%, with those severely impaired in the disability index almost ten times more likely to develop anxiety symptoms than those who were not impaired (p=0.042). This finding is also consistent with the previous study (15). This indicates that patients with severely impaired CADI scoring are at risk of developing anxiety due to acne.

CONCLUSION

This study shows that the severity of acne had an impact on the patient's functional disability. Clinical management of acne patients should include not only pharmacological treatment but should bring additional focus on the patient's functional status and psychological distress. It is important for any doctor or physician treating acne patients to be aware of the risk of developing psychological distress, especially when the clinical condition of acne is within moderate to severe categories. An early referral to the psychiatry unit or counselling as part of holistic patient care should be considered in routine clinical practice.

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